


SOT-227 Power Module

Insulated Standard Recovery Rectifier, 160 A



SOT-227

FEATURES

- Two fully independent diodes
- Fully insulated package
- High voltage rectifiers optimized for very low forward voltage drop
- Industry standard outline
- UL approved file E78996 
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

DESCRIPTION / APPLICATIONS

These devices are intended for use in main rectification. Single or three phase bridge.

PRIMARY CHARACTERISTICS

$I_{F(AV)}$ per module	160 A, $T_C = 101\text{ }^{\circ}\text{C}$
V_{FM} typical at 100 A	1.16 V
Type	Modules - diode, high voltage
Package	SOT-227
Circuit configuration	Two separate diodes, parallel pin-out

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	90 $^{\circ}\text{C}$	91	A
$I_{F(RMS)}$		138	
I_{FSM}	50 Hz	940	
	60 Hz	985	
I^2t	50 Hz	4420	A^2s
	60 Hz	4015	
$I^2\sqrt{t}$		44 180	$\text{A}^2\sqrt{\text{s}}$
V_{RRM}		1200	V
T_J		-55 to +150	$^{\circ}\text{C}$
T_{Stg}		-40 to +150	$^{\circ}\text{C}$

ELECTRICAL SPECIFICATIONS

VOLTAGE RATINGS

TYPE NUMBER	VOLTAGE CODE	V_{RRM} , MAXIMUM REPETITIVE PEAK REVERSE VOLTAGE V	V_{RSM} , MAXIMUM NON-REPETITIVE PEAK REVERSE VOLTAGE V	I_{RRM} TYPICAL AT 150 $^{\circ}\text{C}$ mA
VS-RA160FA120	120	1200	1300	1.0

**FORWARD CONDUCTION**

PARAMETER	SYMBOL	TEST CONDITIONS			VALUES	UNITS
Maximum average forward current at case temperature per leg	I _{F(AV)}	180° conduction, half sine wave, 90 °C			91	A
Maximum RMS forward current per leg	I _{F(RMS)}	DC at 101 °C case temperature			138	A
Maximum peak, one-cycle forward, non-repetitive surge current per leg	I _{FSM}	t = 10 ms	No voltage reapplied	Sinusoidal half wave, initial T _J = T _J maximum	940	
		t = 8.3 ms			985	
		t = 10 ms	100 % V _{RRM} reapplied		790	
		t = 8.3 ms			825	
Maximum I ² t for fusing per leg	I ² t	t = 10 ms	No voltage reapplied			4420
		t = 8.3 ms			4015	
		t = 10 ms	100 % V _{RRM} reapplied		3125	
		t = 8.3 ms			2840	
Maximum I ² √t for fusing per leg	I ² √t	t = 0.1 ms to 10 ms, no voltage reapplied			44 180	A ² √s
Low level of threshold voltage per leg	V _{F(TO)1}	(16.7 % × π × I _{F(AV)}) < I < π × I _{F(AV)} , T _J = T _J maximum			0.80	V
Low level value of forward slope resistance	r _{f1}				4.32	mΩ
High level of threshold voltage per leg	V _{F(TO)2}	(I > π × I _{F(AV)}), T _J = T _J maximum			0.93	V
High level value of forward slope resistance	r _{f2}				4.14	mΩ
Maximum forward voltage drop per leg	V _{FM}	I _{FM} = 100 A, T _J = 25 °C			1.27	V
		I _{FM} = 100 A, T _J = 150 °C			1.22	

BLOCKING

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum peak reverse leakage current per leg	I_{RRM}	$T_J = 25$ °C	150	μA
		$T_J = 150$ °C	1.5	mA
RMS insulation voltage	V_{INS}	$T_J = 25$ °C, any terminal to case, t = 1 minute	2500	V

THERMAL AND MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS
Thermal resistance, per leg junction to case	R_{thJC}	-	-	0.26	°C/W
		-	-	0.13	
Thermal resistance, case to heatsink per module	R_{thCS}	-	0.1	-	
Weight		-	30	-	g
Mounting torque to terminal		-	-	1.1 (9.7)	Nm (lbf. in)
Mounting torque to heatsink		-	-	1.8 (15.9)	Nm (lbf. in)
Case style		SOT-227			

ΔR CONDUCTION PER JUNCTION

DEVICE	SINE HALF WAVE CONDUCTION					RECTANGULAR WAVE CONDUCTION					UNITS
	180°	120°	90°	60°	30°	180°	120°	90°	60°	30°	
VS-RA160FA120	0.109	0.122	0.149	0.213	0.355	0.069	0.119	0.159	0.223	0.358	°C/W

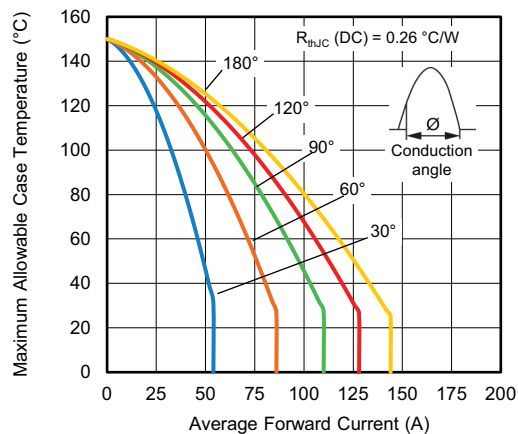


Fig. 1 - Current Ratings Characteristics (A)

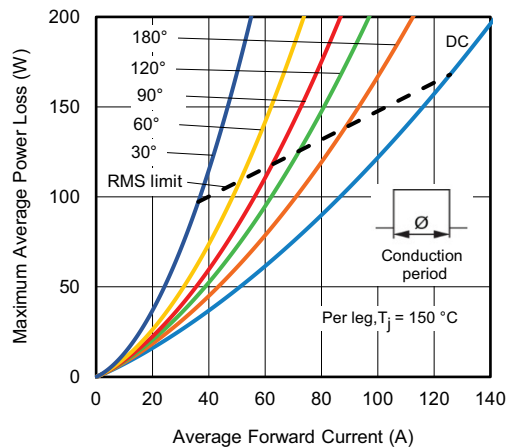


Fig. 4 - Forward Power Loss Characteristics

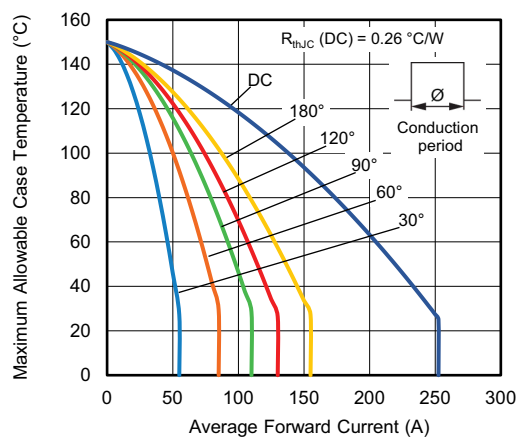


Fig. 2 - Current Ratings Characteristics (A)

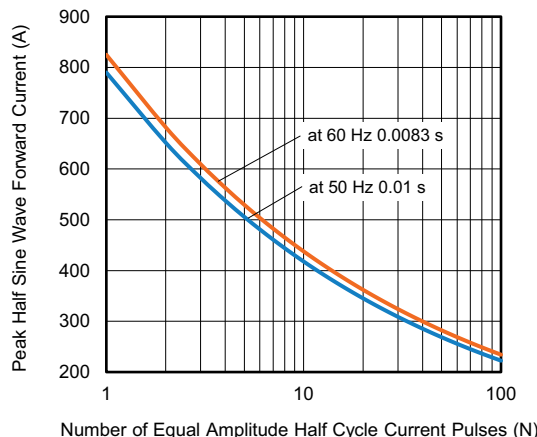


Fig. 5 - Forward Power Loss Characteristics

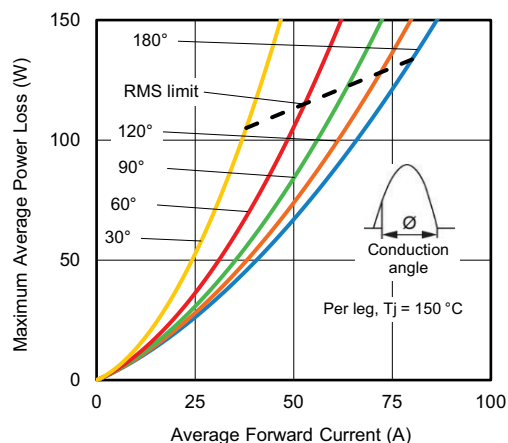


Fig. 3 - Current Ratings Characteristics (A)

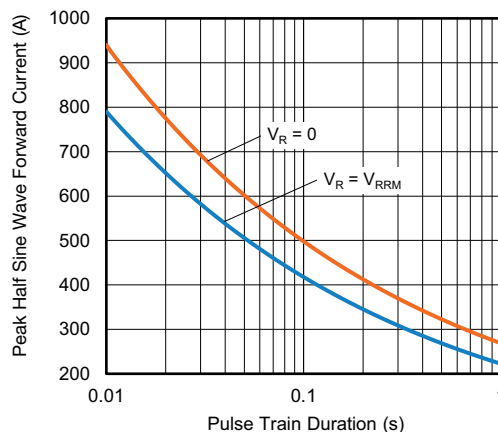


Fig. 6 - Maximum Non-Repetitive Surge Current

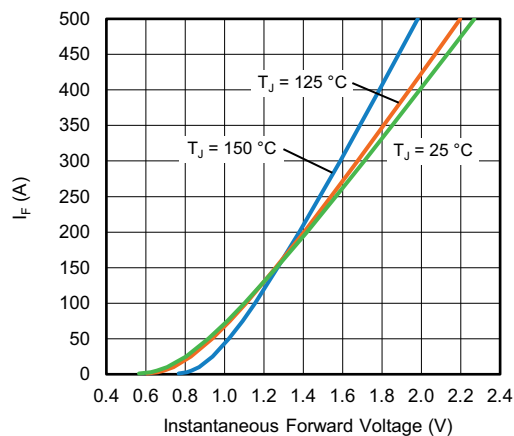
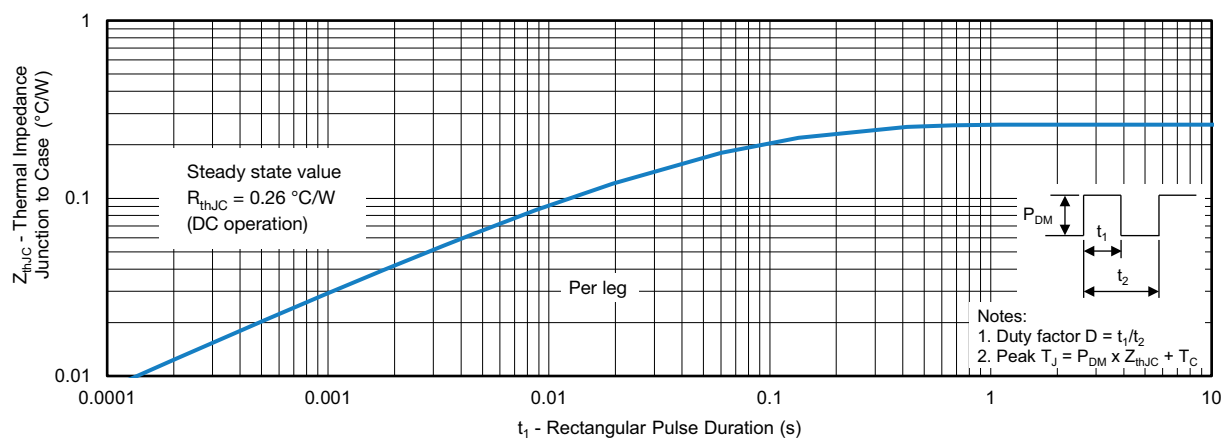


Fig. 7 - Typical Forward Voltage Characteristics


Fig. 8 - Thermal Impedance Z_{thJC} Characteristics

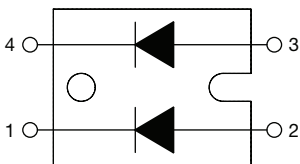
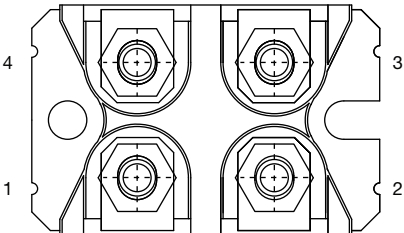
ORDERING INFORMATION TABLE

Device code

VS-	R	A	160	F	A	120
①	②	③	④	⑤	⑥	⑦

- | | |
|---|---|
| 1 | - Vishay Semiconductors product |
| 2 | - Standard recovery diode |
| 3 | - Present silicon generation |
| 4 | - Current rating (160 = 160 A) |
| 5 | - Circuit configuration (2 separate diodes, parallel pin-out) |
| 6 | - Package indicator (SOT-227 standard insulated base) |
| 7 | - Voltage rating (120 = 1200 V) |



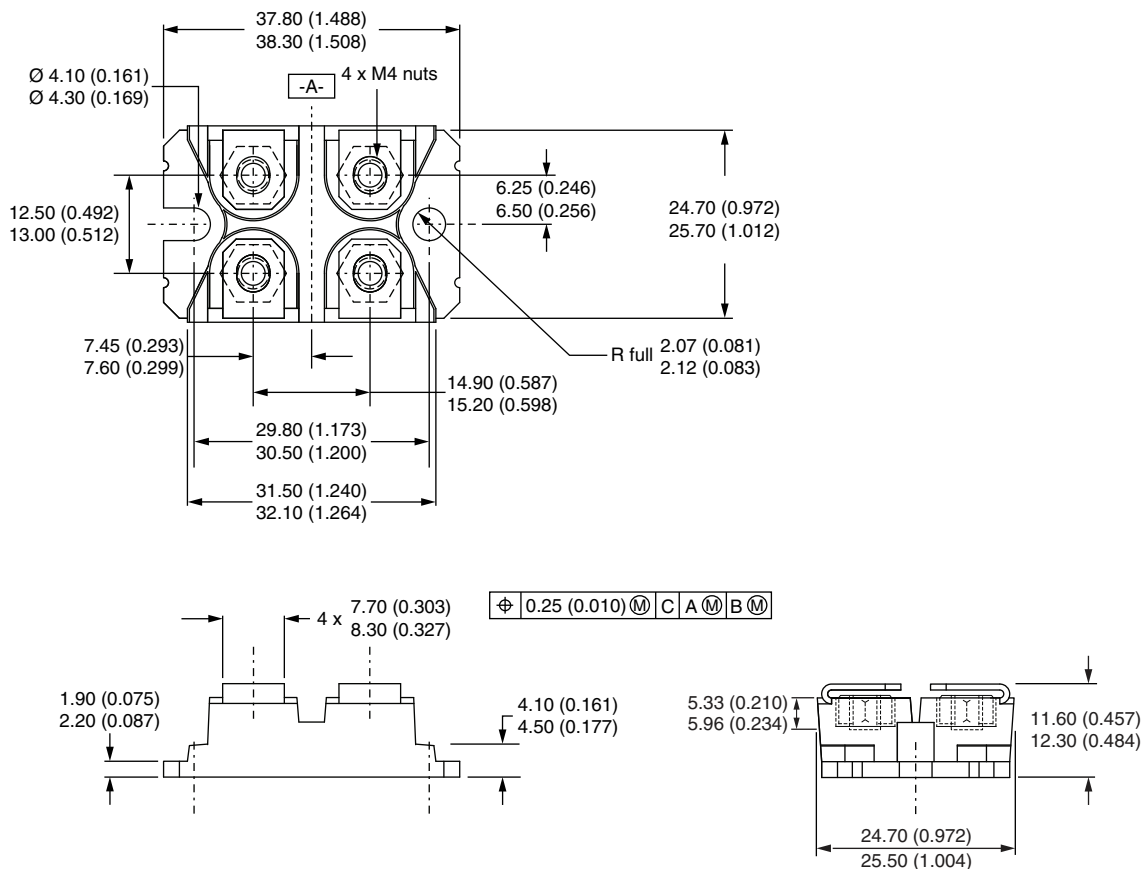
CIRCUIT CONFIGURATION		
CIRCUIT DESCRIPTION	CIRCUIT CONFIGURATION CODE	CIRCUIT DRAWING
Two separate diodes, parallel pin-out	F	<div><div></div><div><p>Lead Assignment</p></div></div>

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95423
Packaging information	www.vishay.com/doc?95425



SOT-227 Generation 2

DIMENSIONS in millimeters (inches)





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